



Cpitrn in Iraqi Females with Thyroid Dysfunction

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Abstract

Background: Changes in thyroid function have significant health consequences on human beings. Women's risk of developing thyroid problems is seven times that of men. The associations between periodontal diseases and thyroid dysfunction had received great attention in periodontal literature in last few decades. In the only few studies that conducted in Iraq, the concentration was primarily directed toward oral health status and dental treatment needs while the periodontal treatment needs have been omitted. This omission is definitely due to absence of implementation of CPITN in these studies.

Aim of the study: to estimate the periodontal health status and periodontal treatment need among Iraqi females with thyroid dysfunction.

Material and methods: sample of this study consist of 225 adult Iraqi females allocated into three comparable groups. Group A (patients with hypothyroidism), Group B (patients with hyperthyroidism) and Group C (control group). CPITN, CAL & TN indices were recorded and the data were analyzed statistically using SPSS program.

Results: generally, healthy women found to have better periodontal health and less clinical attachment loss compared to those with thyroid dysfunction but these results was not significant for all CPITN scores. On the other hand all population sample were found to need periodontal treatment in different levels.

Conclusion: Thyroid dysfunction in its both types (hypothyroidism & hyperthyroidism) has its impact on periodontal health status, but this impact still in need of more extensive researches to expand our knowledge about this vital subject.

Key words: CPITN. Thyroid dysfunction. Periodontitis.

Background

Changes in thyroid function have significant health consequences on human beings. Women's risk of developing thyroid problems is seven times that of men. A family history of thyroid problems and increasing age affect the chances of a woman

developing thyroid problems⁽¹⁾.

The most common symptoms of hypothyroidism are tiredness, feeling cold, constipation, hoarse voice, changes in hair and skin, heavy menstrual periods and weight gain⁽²⁾. In hyperthyroidism, Patients older than

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70 years of old are at risk for anorexia and wasting, atrial fibrillation and congestive heart failure. In younger patients, Graves' disease is the main manifestation. Middle-aged men and women most commonly have toxic nodular goiter. Graves' disease can also put a patient at a higher risk for connective-tissue diseases like Sjogren's syndrome and systemic lupus erythematosus ⁽⁴⁾. Common oral findings in hypothyroidism include macroglossia, dysgeusia, delayed tooth eruption, poor periodontal health and delayed wound healing. On the other hand oral findings in the hyperthyroidism include increased susceptibility to dental caries, periodontal disease, maxillary or mandibular osteoporosis, accelerated dental eruption and burning mouth syndrome ⁽⁵⁾. There are no major side effects of thyroid replacement medication that affect the oral cavity. A common side effect of many medications is xerostomia ⁽⁶⁾.

The associations between periodontal diseases and systemic diseases, especially those causing hormonal disturbances as diabetes mellitus and thyroid dysfunction had received great attention in periodontal literature in last few decades. Toledo et al in 1979 found periodontal changes involving alveolar bone resorption and degeneration in periodontal ligament in rats with hypothyroidism ⁽⁷⁾. Feitosa et al in 2008 study the influence of thyroid hormones on periodontitis related bone loss in rats and concluded that the decrease in serum level of thyroid hormones may enhance such bone loss ⁽⁸⁾. On the other hand, an association between poor oral hygiene and hyperlipidemia and hypercholesterolemia caused by thyroid dysfunction was found in many studies ^(9,10).

The need for reliable indices that not only clarify the etiological factors

of the disease, but also provide a virtual image on the manpower and financial recourses seems to be gaped by the Community Periodontal Index of Treatment Needs (CPITN) proposition in 1982 and the rapid acceptance of this instrument that provided the scientific community with an enormous amount of epidemiological data collected through this index. However based on the limitations identified by several authors during years of research, the World Health Organization (WHO) proposed a few changes to the CPITN in 1987 and again in 1997, but the instrument's diagnostic criteria were basically unaffected by these modifications ⁽¹¹⁾. The CPITN has proven to be a useful tool for planning periodontal treatment needs, establishing population periodontal health goals, and evaluating changes in the periodontal status of a given population after a program implementation ⁽¹²⁻¹⁵⁾.

This index was designed to assess the treatment needs of specific groups. It can be used as a screening or monitoring tool to determine the periodontal treatment needs of either a community or an individual. Only six measurements per a person are recorded, so it is time efficient when assessing a large group. The teeth are first divided into six sextants, maxillary anterior, maxillary right & left posterior with their corresponding mandibular teeth. For a sextant with no teeth or one tooth, an X is marked. If only one functional tooth present, assess with adjacent sextant. Third molars are only assessed if they function in place of second molars. For children and adolescents, one tooth per sextant is evaluated: all first molars, maxillary right central incisor, and mandibular left central incisor. If designated tooth missing, mark sextant with an X. A color coded periodontal

probe been used with this index. Treatment needs can be reported as the number or percentage in each treatment need category OR the mean number of sextants with calculus, bleeding and deep pockets can be calculated for both age groups.

In our country, Iraq only few studies have been carried out on this subject and a very poor data were available ^(16,17). Moreover, in all of these studies the concentration was primarily directed toward oral health status and dental treatment needs and in all of them, the periodontal treatment needs have been omitted. This omission is definitely due to absence of implementation of CPITN in these studies. According to their knowledge, the researchers claim that in Iraq, there is no previous study was conducted to estimate the periodontal treatment need in patients with thyroid dysfunction. For this reason they decided to carry out the present pilot study.

Material and method

This research was conducted during the period from first of February till 15th of March 2012 in AL- KINDY centre for endocrinology and diabetes mellitus in Baghdad city. Researchers have been allowed to conduct this study after a permission was taken from the ministry health and the center authority. This centre receive the referred patients from other district centers of Baghdad city after being diagnosed to have thyroid dysfunction.

Human sample:

sample of this study consist of 225 adult females allocated into three

comparable groups. Group A (patients with hypothyroidism), Group B (patients with hyperthyroidism) and Group C (control group). Each group was designed to include 75 individuals. Individuals in groups A & B (thyroid patients) were selected to be non pregnant, without history of other systemic diseases, no medication intake (other than propranolol, carbimazole & thyroxin hormones) and non smokers.. Individuals in the control group was consists mainly of healthy subjects from patient accompaniers and from those attending researchers private dental clinics for ordinary check up or for scaling and polishing.

Clinical examination:

Overhead lights, plane mouth mirrors, and lightweight CPI probes were used in the examinations. The CPI probe was used in a "sensing" fashion around the tooth to determine the greatest probing pocket depth, to detect subgingival calculus and to provoke inflammatory gingival bleeding. A light "sensing" force was used and the total extent of the sulcus or pocket was explored. The highest score was recorded as recommended by the World Health Organization in 1997 ⁽¹⁸⁾.

Examiner training and calibration were undertaken before the survey, and duplicate examinations were conducted for 10% of subjects after a suitable recovery period was allowed. Both intra and Inter-examiner reliability was tested and a satisfaction was achieved.

The coding and scoring systems employed in this study was as following:

1. For estimation of periodontal health status, the patients are classified according to their number of sextants affected by each code:

0	Healthy periodontal tissues
1	Bleeding after gentle probing
2	Supragingival or subgingival calculus or defective margin of filling or crown
3	4mm or 5mm pocket
4	6mm or deeper pathologic pocket
x	Excluded sextant

2. To estimate the clinical attachment loss, the distance (in mm) from the cemento-enamel junction to the deepest point of the pocket was recorded. Patients then classified according to the following criteria:

0	Loss of attachment 0-3 mm
1	Loss of attachment 4-5 mm
2	Loss of attachment 6-8 mm
3	Loss of attachment 9-11 mm
4	Loss of attachment 12 mm or more
x	Excluded sextant

3. For treatment need, the patients are classified into treatment needs based on the highest code recorded:

0	No need for treatment (Code 0)
1	Oral hygiene instruction (Code 1)
2	OHI + scaling and root planing, including elimination of plaque-retentive margins (Codes 2 & 3)
3	OHI + scaling and root planing + complex periodontal therapy that may include surgical intervention and/or deep scaling and root planing with local anesthetic (Code 4)

Results

Results of this research show that, females with thyroid dysfunction have a slight higher means of missing teeth comparing to those in control group. (Table 1)

The results also showed that females in control group have better periodontal health than those with thyroid dysfunction, this is reflected as a greater means of sextants with (CPITN score 0) which refer to presence of healthy periodontium. On the other hand females in thyroid dysfunction groups have greater means of sextants with (CPITN score 3&4) which indicate more sever periodontal disease with pocket formation. (Table 2)

The results also showed that females in control group have less clinical attachment loss than those with thyroid dysfunction, this is reflected as a greater means in (CAL score 0) in comparison to females in thyroid dysfunction groups who have greater means in (CAL score 4) which indicate more clinical attachment loss. (Table 3)

In testing significance of these results, paired t-test showed that the greater means of sextants with (CPITN score 0) in control group was highly significant in comparison to those in both thyroid dysfunction groups. Moreover, the greater means of sextants with (CPITN score 0) in

hyperthyroidism group was highly significant in comparison to those in hypothyroidism group. It is also found that the greater means of sextants with (CPITN score 3) in hypothyroidism group was significant in comparison to those in control group and highly significant to those in hyperthyroidism group. The other important finding in this study was that the greater means of sextants with (CPITN score 4) in both thyroid dysfunction groups were highly significant in comparison to those in control group. Other comparisons than mentioned above were found to be not significant. (Table 4)

Regarding the CAL, paired t-test showed that the greater means values of (CAL score 0) in control group was highly significant in comparison to those in hypothyroidism group and significant in comparison to those in hyperthyroidism group. Other finding in this subject was that the smaller means values of (CAL score 2) in control group were significant in comparison to those in hypothyroidism group and not significant in comparison to those in hyperthyroidism group. Other comparisons than mentioned above were found to be not significant. (Table 5)

Regarding periodontal treatment need, results of this research showed that 100 % of the population sample in all groups were in need of oral hygiene instruction (TN score 1) with or without scaling and root planing, including elimination of plaque-retentive margins (TN score 2). It also found that 14% of the population sample in the control group were in need of complex periodontal therapy that may include surgical intervention and/or deep scaling and root planing (TN score 3) in comparison to 24 % in both thyroid dysfunction groups. (Table 6)

Discussion

Thyroid dysfunction is the second most common glandular disorder of the endocrine system and it is increasing, predominantly among women. This is probably because thyroid disease is often an autoimmune disease and most autoimmune conditions are more common in women⁽¹⁹⁾. Depending on this fact, the sample of the present study was composed of females only. Thyroid dysfunction (as hormonal disturbance disease) may rear its head in any system in the body including the mouth. The oral cavity is adversely affected by either an excess or deficiency of these hormones. Between 10 and 20 percent of women will have thyroid dysfunction following pregnancy. Hypothyroidism occurs most frequently in women entering menopause, which typically occurs in their late 40s and early 50s.

As many as 17 % of women have an underactive thyroid by age 60, this means patients with undiagnosed thyroid dysfunction may seen in the dental chair, where routine treatment has the potential to result in adverse outcomes⁽²⁰⁾. Based on these facts, an understanding of thyroid dysfunction is of significant importance to the dentist for two reasons. First, the dentist may be the first to suspect a serious thyroid disorder and aid in early diagnosis. The second reason is to avoid possible dental complications resulting from treating patients with the thyroid disorders. Among Modifications of dental care that must be considered when treating patients who have thyroid disease are: stress reduction, awareness of drug side effects or interactions, and vigilance for appearance of signs or symptoms of hormone toxicity.

From the results of the present research, one can conclude simply that all of females in the thyroid

dysfunction and control groups had experienced periodontal disease, but the females in the thyroid dysfunction groups had worse periodontal condition and more clinical attachment loss when compared with control group. These results came in agreement with the result of (Zahid et al. 2011) ⁽²¹⁾.

Estimation of treatment need for any health threatens disease is the most important objective of any health care program. Unfortunately most of studies that carried out in Iraq didn't draw attention for this important point. For this reason, the present study was concentrate on estimation of the treatment need besides observing the health status. It is so clear from the results that all subjects in the present study were in need of certain type of periodontal treatment as oral hygiene instructions, scaling and root planning or even a complex periodontal treatment including periodontal surgery. This need was greater in thyroid dysfunction groups (24%) in comparison to the control group (14%). These finding could be accounted for the privilege of the present study.

Conclusion

Thyroid dysfunction in its both types (hypothyroidism & hyperthyroidism) has its impact on periodontal health status, however, this impact was not found to be statistically significant in all study parameters. Although diseases with hormonal disturbances as thyroid dysfunction seems to be logically related to periodontal disease prevalence and severity, but this relation still in need of more extensive researches to explore the exact interrelation and to expand our knowledge about this vital subject.

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Table (1) Numbers, age range and means of present & missing teeth in different groups

Hyperthyroidism	Hypothyroidism	Control	Parameters
75	75	75	Numbers
42.7	42.6	42.2	Age range
22.4	22.7	24.4	Present teeth
5.6	5.3	3.6	Missing teeth

Table (2) Means and std. deviation of CPITN scores in different groups

Hyperthyroidism		Hypothyroidism		Control		CPITN Scores
std. deviation	Mean	std. deviation	Mean	std. deviation	Mean	
0.33714	0.1286	0.11952	0.0143	1.14579	0.6143	0
0.73496	0.5571	0.80385	0.6143	1.13490	0.7571	1
1.74699	3.3857	1.76907	3.0286	1.55140	3.3571	2
0.87949	0.7429	1.51056	1.3286	1.18164	0.7714	3
1.23241	0.6000	0.94134	0.4286	0.59675	0.1429	4
1.11084	0.5714	1.16372	0.5286	0.58783	0.2714	x

Table (3) Means and std. deviation of CAL scores in different groups

Hyperthyroidism		Hypothyroidism		Control		CAL Scores
std. deviation	Mean	std. deviation	Mean	std. deviation	Mean	
2.05433	4.2000	2.02551	4.1143	1.31254	4.7571	0
1.28537	1.0000	1.33561	0.8857	1.11539	0.8714	1
0.53761	0.1714	0.57573	0.2429	0.28196	0.0857	2
0.11952	0.0143	0.31028	0.0714	0.11952	0.0143	3
0.11952	0.0143	0.11952	0.0143	0.00000	0.0000	4
1.10981	0.5857	1.19774	0.5857	0.58783	0.2714	x

Table (4) Comparison of CPITN scores in different groups

Hypothyroidism vs Hyperthyroidism			Control vs Hyperthyroidism			Control vs Hypothyroidism			CPITN Scores
Sig	p- value	t-value	Sig	p- value	t-value	Sig	p- value	t-value	
HS	0.010	-2.635	HS	0.000	3.992	HS	0.000	4.329	0
NS	0.575	0.563	NS	0.203	1.284	NS	0.373	0.897	1
NS	0.174	-1.375	NS	0.921	-0.100	NS	0.234	1.201	2
HS	0.004	2.945	NS	0.857	0.181	S	0.016	-2.472	3
NS	0.349	-0.942	HS	0.008	-2.711	HS	0.010	-2.647	4

Table (5) Comparison of CAL scores in different groups

Hypothyroidism vs Hyperthyroidism			Control vs Hyperthyroidism			Control vs Hypothyroidism			CAL Scores
Sig	p- value	t-value	Sig	p- value	t-value	Sig	p- value	t-value	
NS	0.743	-0.329	S	0.035	2.154	HS	0.007	2.792	0
NS	0.535	-0.584	NS	0.535	-0.623	NS	0.934	-0.083	1
NS	0.460	0.743	NS	0.159	-1.425	S	0.040	-2.091	2
NS	0.159	1.425	NS	1.000	0.000	NS	0.159	-1.425	3
NS	1.000	0.000	NS	0.321	-1.000	NS	0.596	0.01421	4

Table (6) Periodontal Treatment Need in different groups

Hyperthyroidism		Hypothyroidism		Control		TN Scores
Percentage	Number	Percentage	Number	Percentage	Number	
0.0 %	0.0	0.0 %	0.0	0.0 %	0.0	0
100 %	75	100 %	75	100 %	75	1
100 %	75	100 %	75	100 %	75	2
24 %	18	24 %	18	14 %	11	3